

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A lane **departure prevention keep** control apparatus for an automotive vehicle, comprising:

a vehicular traveling information detecting section that detects an acute angle (ϕ) formed between a traffic lane on which the vehicle is traveling and a forward-and backward axis of the vehicle;

a deviation tendency detecting section that detects a state of a tendency of vehicular deviation from the traffic lane on which the vehicle is traveling;

a deceleration controlled variable calculating section that calculates a deceleration controlled variable on the basis of ~~a state of~~ **the state of the** ~~[[a]]~~ tendency of **the** ~~[[a]]~~ vehicular deviation from **the** ~~[[a]]~~ traffic lane on which the vehicle is traveling; ~~and~~

a braking force controlling section that controls a braking force acted upon ~~each of the driven~~ wheels of the vehicle on the basis of the calculated deceleration controlled variable; **and**

a correcting section that corrects at least one of a parameter for detecting the state of the tendency of the deviation from the traffic lane on which the vehicle is traveling so as to detect lane deviation at an earlier timing, and a parameter for computing the calculated deceleration controlled variable so as to increase the calculated deceleration controlled variable, as the acute angle (ϕ) becomes larger.

2. (Currently Amended) A lane **departure prevention keep** control apparatus for an automotive vehicle as claimed in claim 1, wherein the ~~lane keep control apparatus further comprises: a~~ vehicular traveling information detecting section ~~that~~ detects at least one of a vehicular traveling state and a vehicular traveling environment; ~~and a deviation tendency detecting section that detects the state of the tendency of the vehicular deviation from the traffic lane on which the vehicle is traveling, and~~ wherein the deceleration controlled variable calculating section calculates the deceleration controlled variable on the basis of the

state of the tendency of the vehicular deviation from the traffic lane of the vehicle on which the vehicle is traveling.

3. (Currently Amended) A lane departure prevention keep control apparatus for an automotive vehicle as claimed in claim 2, wherein the vehicular traveling information detecting section detects ~~at least one of an acute angle (ϕ) formed between the traffic lane on which the vehicle is traveling and a forward and backward axis of the vehicle and a~~ curvature of the traffic lane on which the vehicle is traveling and wherein the deviation tendency detecting section detects the state of the tendency of the vehicular deviation from the traffic lane on the basis of at least one of the acute angle formed between the traffic lane on which the vehicle is traveling and the forward-and-~~rearward~~ backward axis of the vehicle and the curvature of the traffic lane on which the vehicle is traveling.

4. (Currently Amended) A lane departure prevention keep control apparatus for an automotive vehicle as claimed in claim 2, wherein the lane departure prevention keep control apparatus further comprises a turning state detecting section that detects a turning state of the vehicle and wherein the deviation tendency detecting section detects the state of the tendency of the vehicular deviation from the traffic lane on which the vehicle is traveling on the basis of at least one of the vehicular traveling state and the traveling environment detected by the vehicular traveling information detecting section and on the basis of the vehicular turning state detected by the turning state detecting section.

5. (Currently Amended) A lane departure prevention keep control apparatus for an automotive vehicle as claimed in claim 4, wherein the vehicular traveling information detecting section detects a curvature of the traffic lane on which the vehicle is traveling, the turning state detecting section detects a vehicular turning curvature on the basis of at least one of a traveling speed of the vehicle, a steering angle thereof, and a yaw rate thereof, and the deviation tendency detecting section detects the state of the tendency of the vehicular deviation from the traffic lane on the basis of the curvature of the traffic lane detected by the vehicular traveling information detecting section and the vehicular turning curvature detected by the turning state detecting section.

6. (Currently Amended) A lane **departure prevention keep** control apparatus for an automotive vehicle as claimed in claim 5, wherein the deviation tendency detecting section calculates a future deviation quantity estimated value from the traffic lane on which the vehicle is traveling on the basis of the curvature of the traffic lane detected by the vehicular traveling information detecting section and the vehicular turning curvature detected by the vehicular turning state detecting section.

7. (Currently Amended) A lane **departure prevention keep** control apparatus for an automotive vehicle as claimed in claim 3, wherein the vehicular traveling information detecting section detects both of the acute angle (ϕ) formed between the traffic lane on which the vehicle is traveling and the forward-and-backward axis of the vehicle and the curvature (β) of the traffic lane and the deviation tendency detecting section detects the state of the tendency of the vehicular deviation from the traffic lane on the basis of both of the acute angle (ϕ) formed therebetween and the curvature (β) of the traffic lane on which the vehicle is traveling.

8. (Currently Amended) A lane **departure prevention keep** control apparatus for an automotive vehicle as claimed in claim 7, wherein the deviation tendency detecting section comprises: a future estimated lateral displacement calculating section that calculates a future estimated lateral displacement (XS) of the vehicle with respect to the traffic lane on the basis of a traveling speed (V) of the vehicle, the acute angle (ϕ) formed between the traffic lane and the forward-and-backward axis of the vehicle, and the curvature (β) of the traffic lane; and a first determining section that determines whether a magnitude of the future estimated lateral displacement (XS) of the vehicle is equal to or larger than a deviation determination threshold value (Xc), wherein the deviation tendency detecting section detects the state of **the tendency of** the vehicular deviation from the traffic lane when the first determining section determines that the magnitude of the future estimated lateral displacement (XS) is equal to or larger than the deviation determination threshold value (Xc).

9. (Currently Amended) A lane **departure prevention keep** control apparatus for an automotive vehicle as claimed in claim 8, wherein the deviation determination

threshold value (X_c) is a lateral displacement limit value which is set to provide a relatively large constant value in a first region in which an absolute value $|\phi|$ of the acute angle formed between the traffic lane and the forward-and-backward axis of the vehicle is smaller than a predetermined small value, is set to provide a relatively small constant value in a second region in which the absolute value $|\phi|$ of the acute angle formed therebetween is equal to or larger than a predetermined large value, and is set to be linearly decreased along with an increase in the absolute value $|\phi|$ of the acute angle formed therebetween in an intermediate region between the first and second regions.

10. (Currently Amended) A lane departure prevention ~~keep~~ control apparatus for an automotive vehicle as claimed in claim 8, wherein the deviation determination threshold value (X_c) is a lateral displacement limit value, which is set to provide a relatively large constant value in a first region in which an absolute value $|\beta|$ of the curvature of the traffic lane on which the vehicle is traveling is smaller than a predetermined small value, is set to provide a relatively small constant value in a second region in which the absolute value $|\beta|$ of the curvature of the traffic lane is equal to or larger than a predetermined large value, and is linearly decreased along with an increase of the absolute value $|\beta|$ of the acute angle formed therebetween in an intermediate region between the first and second regions.

11. (Currently Amended) A lane departure prevention ~~keep~~ control apparatus for an automotive vehicle as claimed in claim 8, wherein the deviation tendency detecting section further comprises a second determining section that determines whether the magnitude of the future estimated lateral displacement (X_S) of the vehicle is smaller than zero and is smaller than an inverted value ($-X_c$) of a sign of the deviation determination threshold value (X_c) and wherein the deviation tendency detecting section detects the state of the tendency of the vehicular deviation from the traffic lane when the second determining section determines that the magnitude of the future estimated lateral displacement (X_S) is smaller than zero and is smaller than the inverted value ($-X_c$) of the sign of the deviation determination threshold value (X_c).

12. (Currently Amended) A lane departure prevention keep control apparatus for an automotive vehicle as claimed in claim 11, wherein the deceleration controlled variable calculating section calculates the deceleration controlled variable on the basis of a first proportional coefficient (K_{v1}) determined from vehicular specifications, a second proportional coefficient (K_s) determined from the traveling velocity (V) of the vehicle, a third proportional coefficient (K_y) determined from the acute angle formed between the traffic lane and the forward-and-backward axis of the vehicle, an absolute value ($|XS|$) of the future estimated lateral displacement, and the deviation determination threshold value (X_c).

13. (Currently Amended) A lane departure prevention keep control apparatus for an automotive vehicle as claimed in claim 12, wherein the third proportional coefficient (K_y) is set to provide a relatively large constant value in a first region in which an absolute value ($|\phi|$) of the acute angle formed between the traffic lane and the forward-and-backward axis of the vehicle is equal to or larger than a predetermined large value, is set to be smaller than a predetermined small value in a second region in which the absolute value ($|\phi|$) of the acute angle formed between the traffic lane and the forward-and-backward axis of the vehicle is smaller than a predetermined small value, and is set to be linearly increased along with an increase of the absolute value ($|\phi|$) of the acute angle formed between the traffic lane and the forward-and-backward axis of the vehicle in an intermediate region between the first and second regions.

14. (Currently Amended) A lane departure prevention keep control apparatus for an automotive vehicle as claimed in claim 12, wherein the third proportional coefficient (K_y) is set to provide a relatively large constant value in a first region in which an absolute value ($|\beta|$) of the curvature of the traffic lane on which the vehicle is traveling is equal to or larger than a predetermined large value, is set to be smaller than a predetermined small value in a second region in which the absolute value ($|\beta|$) of the curvature (β) of the traffic lane is smaller than a predetermined small value, and is set to be linearly increased along with an increase of the absolute value ($|\phi|$) of the acute angle formed between the traffic lane and the

forward-and-backward axis of the vehicle in an intermediate region between the first and second regions.

15.-20. (Cancelled)

21. (Currently Amended) A lane departure prevention keep control apparatus for an automotive vehicle, comprising:

a vehicular traveling information detecting means for detecting an acute angle (ϕ) formed between a traffic lane on which the vehicle is traveling and a forward-and backward axis of the vehicle;

a deviation tendency detecting means for detecting a state of a tendency of vehicular deviation from the traffic lane on which the vehicle is traveling;

a deceleration controlled variable calculating means for calculating a deceleration controlled variable on the basis of a state of a tendency of a vehicular deviation from a traffic lane on which the vehicle is traveling; and

a braking force controlling means for controlling a braking force acted upon each of the driven wheels of the vehicle on the basis of the calculated deceleration controlled variable; and

a correcting means for correcting at least one of a parameter for detecting the state of the tendency of the deviation from the traffic lane on which the vehicle is traveling so as to detect lane deviation at an earlier timing, and a parameter for computing the calculated deceleration controlled variable so as to increase the calculated deceleration controlled variable, as the acute angle (ϕ) becomes larger.

22. (Currently Amended) A lane departure prevention keep method for an automotive vehicle, comprising:

detecting an acute angle (ϕ) formed between a traffic lane on which the vehicle is traveling and a forward-and backward axis of the vehicle;

detecting a state of a tendency of vehicular deviation from the traffic lane on which the vehicle is traveling;

calculating a deceleration controlled variable on the basis of ~~a state of~~ the state of the ~~[[a]]~~ tendency of the ~~[[a]]~~ vehicular deviation from ~~[[a]]~~ the traffic lane on which the vehicle is traveling; ~~and~~

controlling a braking force acted upon ~~each of the driven~~ wheels of the vehicle on the basis of the calculated deceleration controlled variable; and

correcting at least one of a parameter for detecting the state of the tendency of the deviation so as to detect lane deviation at earlier timing, and a parameter for computing the calculated deceleration controlled variable so as to increase the calculated deceleration controlled variable, as the acute angle (ϕ) becomes larger.

23. (Cancelled)

24. (Currently Amended) A lane departure prevention control apparatus for an automotive vehicle, comprising:

a deceleration controlled variable calculating section that calculates a deceleration controlled variable on the basis of a state of a tendency of a vehicular deviation from a traffic lane on which the vehicle is traveling; and

a braking force controlling section that controls a braking force acted upon each of the driven wheels of the vehicle on the basis of the calculated deceleration controlled variable;

~~A lane keep control apparatus for an automotive vehicle as claimed in claim 1,~~
wherein the deceleration controlled variable calculating section calculates the deceleration controlled variable on the basis of a proportional coefficient (K_t) and a difference ($V - V_t$) between a vehicular traveling velocity (V) and a calculated target vehicle velocity (V_t).

25. (Cancelled)

26. (Currently Amended) A lane departure prevention control apparatus for an automotive vehicle, comprising:

deceleration controlled variable calculating means for calculating a deceleration controlled variable on the basis of a state of a tendency of a vehicular deviation from a traffic lane on which the vehicle is traveling; and

braking force controlling means for controlling a braking force acted upon each of the driven wheels of the vehicle on the basis of the calculated deceleration controlled variable;

~~A lane keep control apparatus for an automotive vehicle as claimed in claim 21,~~
wherein the deceleration controlled variable calculating means calculates the deceleration controlled variable on the basis of a proportional coefficient (Kt) and a difference ($V - V_t$) between a vehicular traveling velocity (V) and a calculated target vehicle velocity (V_t).

27. (Cancelled)

28. (Currently Amended) A lane departure prevention control method for an automotive vehicle, comprising:

calculating a deceleration controlled variable on the basis of a state of a tendency of a vehicular deviation from a traffic lane on which the vehicle is traveling; and

controlling a braking force acted upon each of the driven wheels of the vehicle on the basis of the calculated deceleration controlled variable;

~~A lane keep control apparatus for an automotive vehicle as claimed in claim 22,~~
wherein ~~calculation of~~ calculating the deceleration controlled variable is performed on the basis of a proportional coefficient (Kt) and a difference ($V - V_t$) between a vehicular traveling velocity (V) and a calculated target vehicle velocity (V_t).

29. (New) A lane departure prevention control apparatus for an automotive vehicle as claimed in claim 1, wherein the braking force controlling section is adapted to determine a target braking fluid pressure based on the calculated deceleration controlled variable, and the

lane departure prevention control apparatus is adapted to output the target braking fluid pressure to each road wheel of the vehicle to decelerate the vehicle.

30. (New) A lane departure prevention control apparatus for an automotive vehicle as claimed in claim 21, wherein the braking force controlling means is adapted to determine a target braking fluid pressure based on the calculated deceleration controlled variable, and the lane departure prevention control apparatus is adapted to output the target braking fluid pressure to each road wheel of the vehicle to decelerate the vehicle.

31. (New) A lane departure prevention control method for an automotive vehicle as claimed in claim 22, further comprising determining a target braking fluid pressure based on the calculated deceleration controlled variable, and outputting the target braking fluid pressure to each road wheel of the vehicle to decelerate the vehicle.